7. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding 1,1,2,2-tetrachloroethane in air, water, and other media are summarized in Table 7-l.

An intermediate-duration inhalation MRL of 0.4 ppm was derived. The MRL is based on a LOAEL of 130 ppm, 5 hours per day, 5 days per week for 15 weeks for hepatic effects in rats in a study by Truffert et al. (1977).

An intermediate-duration oral MRL of 0.6 mg/kg/day was derived. The MRL is based on a NOAEL of 56 mg/kg/day for reduced body weight gain in rats (NCI 1978). The LOAEL was 100 mg/kg/day.

A chronic-duration oral MRL of 0.04 mg/kg/day was derived. The MRL is based on a LOAEL of 43 mg/kg/day for respiratory effect in female rats given gavage doses of 1,1,2,2-tetrachloroethane in corn oil for 78 weeks in a study by NCI (1978).

The EPA reference dose for 1,1,2,2-tetrachloroethane is undergoing review by an EPA Workgroup. No EPA reference concentration exists for the compound.

1,1,2,2-Tetrachloroethane is on the list of chemicals appearing in “The Emergency Planning and Community Right-to-Know Act of 1986” (EPCRA) (EPA 1988). Section 313 of Title III of EPCRA requires owners and operators of certain facilities that manufacture, import, process, or otherwise use the chemicals on this list to report annually their release of those chemicals to any environmental media.

OSHA requires employers of workers who are occupationally exposed to 1,1,2,2-tetrachloroethane to institute engineering controls and work practices to reduce and maintain employee exposure at or below permissible exposure limits (PEL). The employer must use engineering and workpractice controls, if feasible, to reduce exposure to or below an 8-hour time-weighted average (TWA) of 1 ppm. Respirators must be provided and used during the time period necessary to install or implement feasible engineering and work practice controls (OSHA 1974).

7. REGULATIONS AND ADVISORIES

1,1,2,2-Tetrachloroethane is regulated by the Clean Water Effluent Guidelines as stated in Title 40, Section 400-475, of the Code of Federal Regulations. For each point source category, 1,1,2,2-tetrachloroethane may be regulated as one of a group of chemicals controlled as Total Toxic Organics, or may have a Zero Discharge Limitation. The point source categories for which 1,1,2,2-tetrachloroethane is controlled as a Total Toxic Organic include electroplating (EPA 1981), metal finishing (EPA 1983a), and coil coating (EPA 1982a). The point source category for which 1,1,2,2-tetrachloroethane has a Zero Discharge Limitation is steam electric power generation (EPA 1982b).

The Resource Conservation and Recovery Act (RCRA) identifies 1,1,2,2-tetrachloroethane as a hazardous waste when discarded as a commercial chemical product, off-spec species, container residue, or spill residue (EPA 1980a).

7. REGULATIONS AND ADVISORIES

7-1. Regulations and Guidelines Applicable to 1,1,2,2 Tetrachloroethane

Agency	Description	Information	Reference
INTERNATIONAL			
WHO		NA	
IARC	Cancer classification	3[a]	IARC 1987
NATIONAL			
Regulations:			
a. Air:			
EPA/OAR	Hazardous Air Pollutant	Yes	Clean Air Act Amendments Title III, Section 112(b) U.S. Congress 1990
	Performance Standards - Equipment Leaks in Synthetic Organic Chemical Manufacturing Industry	Yes	40 CFR 60.489 EPA 1983b
	Chemical Affected by Subpart NNN[a]	Yes	40 CFR 60.667 EPA 1990
OSHA	PEL (TWA)	5 ppm	29 CFR 1910.1000 OSHA 1974
		35 mg/m^3	
b. Water: EPA/OW	Ambient Water Quality Criterion	1.7x10^{-1} µg/L	EPA 1980b 48 FR 79318 (11/28/80)
	Appendix D - NPDES Permit Application Testing Requirements (122.21)	Yes	40 CFR 122 EPA 1983a
	Form 2D	NA	40 CFR 122 EPA 1983a
	Identification of Test Procedures	Yes	40 CFR 136.3 EPA 1973
	Method 601 - Purgeable Halocarbons	Yes	40 CFR 136 EPA 1973
	Method 624 - Purgeables	Yes	40 CFR 136 EPA 1973
EPA-ODW	Special Monitoring for Inorganic and Organic Chemicals	Yes	40 CFR 141.40 EPA 1975
	Special Monitoring for Organic Chemicals	Yes	40 CFR 141.40 EPA 1975
c. Food: EPA/OPTS	Tolerance range for agriculture products	Yes	
d. Other:			
DOT	Hazard Classification ORM-A	Yes	49 CFR 172.101 DOT 1991a
	Labeling Requirements - Poison	Yes	49 CFR 172.101 and Subpart E DOT 1991a
EPA/OERR/ CEPP	Reportable Quantity	100 lb.	40 CFR 302 EPA 1985a

7. REGULATIONS AND ADVISORIES

7-1. Regulations and Guidelines Applicable to 1,1,2,2 Tetrachloroethane (continued)

Agency	Description	Information	Reference
NATIONAL (cont.)			
EPA/OSW	Appendix I - Constituents for Detection Monitoring in Municipal Solid Waste Landfills	Yes	40 CFR 258 EPA 1991
	Appendix II - List of Hazardous Inorganic and Organic Constituents	Provides 3 EPA test methods and Practical Quantitation Limits	40 CFR 258 EPA 1991
Guidelines: a. Air: ACGIH	Ceiling limit for Occupational Exposure (TLV-TWA)	1 ppm (skin)	ACGIH 1994
	TWA	6.9 mg/m^3	Sittig 1994
EPA	q_1* Cancer Slope Factor (inhalation exposure)	0.2 mg/kg/d	IRIS 1995
NIOSH	Recommended Exposure Limit for Occupational exposure (TWA)	1 ppm (air)	NIOSH 1992
	Immediately Dangerous to Life and Health	150 ppm	NIOSH 1992
b. Water: EPA/OW			
	q_1* cancer slope factor (oral exposure)	0.2 mg/kg/d	IRIS 1995
c. Other:			
EPA	Cancer classification	Group C[b]	IRIS 1995
NIOSH	Cancer classification	Potential occupational carcinogen	NIOSH 1992
NTP	Cancer classification	Positive (mice) Equivocal (male rats) Negative (female rats)	NTP 1995
STATE			
Regulations and Guidelines a. Air:			
	Acceptable Ambient Air Concentration Guidelines or Standards		NATICH 1992
AZ	1 hr. avg. time	3.3x10^1 µg/m^3 (4.81x10^{-3} ppm)	

7. REGULATIONS AND ADVISORIES

7-1. Regulations and Guidelines Applicable to 1,1,2,2 Tetrachloroethane (continued)

Agency	Description	Information	Reference
STATE (cont.)			
	24-hr. avg. time	8.8 $\mu g/m^3$ ($1.28x10^{-3}$ ppm)	
CT	8 hr. avg. time	$3.44x10^{1}$ $\mu g/m^3$ ($5x10^{-3}$ ppm)	
FL-FTLDLE	8 hr. avg. time	$7.0x10^{-2}$ $\mu g/m^3$ ($1.020x10^{-5}$ ppm)	
FL-PINELLA	8 hr. avg. time	$7.0x10^{1}$ $\mu g/m^3$ ($1x10^{-2}$ ppm)	
	24 hr. avg. time	$1.68x10^{1}$ $\mu g/m^3$ ($2.45x10^{-3}$ ppm)	
	Annual avg. time	$1.7x10^{-2}$ $\mu g/m^3$ ($2.48x10^{-6}$ ppm)	
FL-TAMPA	8 hr. avg. time	$7.0x10^{-2}$ mg/m^3 ($1.02x10^{-5}$ ppm)	
KS	Annual avg. time	$1.72x10^{-2}$ $\mu g/m^3$ ($2.51x10^{-6}$ ppm)	
KS-KC	1 yr. avg. time	$1.72x10^{-2}$ $\mu g/m^3$ ($2.51x10^{-6}$ ppm)	
LA	Annual avg. time	1.7 $\mu g/m^3$ ($2.48x10^{-4}$ ppm)	
MA	24 hr. avg. time	$1.87x10^{1}$ $\mu g/m^3$ ($2.72x10^{-3}$ ppm)	
	Annual avg. time	$2.0x10^{-2}$ $\mu g/m^3$ ($2.91x10^{-6}$ ppm)	

7. REGULATIONS AND ADVISORIES

7-1. Regulations and Guidelines Applicable to 1,1,2,2 Tetrachloroethane (continued)

Agency	Description	Information	Reference
STATE (cont.)			
MI	Annual avg. time	2.0×10^{-2} µg/m^3 (2.91×10^{-6} ppm)	
NV	8 hr. avg. time	1.67×10^{-1} mg/m^3 (2.4×10^{-2} ppm)	
NY	1 yr. avg. time	2.33×10^{1} µg/m^3 (3.39×10^{-3} ppm)	
OK	24 hr. avg. time	6.8×10^{1} µg/m^3 (9.9×10^{-3} ppm)	
PA-PHIL.	1 yr. avg. time	1.68×10^{2} µg/m^3 (2.4×10^{-2} ppm)	
	(Not given)	2.4×10^{1} µg/m^3 (3.5×10^{-3} ppm)	
SC	24 hr. avg. time	3.5×10^{1} µg/m^3 (5.1×10^{-3} ppm)	
TX	30 min. avg. time	7.0×10^{1} µg/m^3 (1.0×10^{-2} ppm)	
	Annual avg. time	7.0 µg/m^3 (1.0×10^{-3} ppm)	
VA	24 hr. avg. time	1.2×10^{2} µg/m^3 (1.7×10^{-2} ppm)	
VT	Annual avg. time	1.7×10^{-2} µg/m^3 (2.5×10^{-6} ppm)	
WA-SWEST	24 hr. avg. time	2.33×10^{1} µg/m^3 (3.4×10^{-3} ppm)	

7. REGULATIONS AND ADVISORIES

7-1. Regulations and Guidelines Applicable to 1,1,2,2 Tetrachloroethane (continued)

Agency	Description	Information	Reference
STATE (cont.)			
b. Water:			
	Water Quality: Human Health		CELDs 1993
AL	Listed but no data		
AZ	Drinking water guideline	0.17 µg/L	
	Fish consumption	11.0 µg/L	
CA	Drinking water standard	1.0 µg/L	FSTRAC 1990
CT	Organism consumption only	11.0[a]	CELDs 1993
	Organism & water ingestion	0.17[a]	
DE	Freshwater fish ingestion	13.5 µg/L	
	Freshwater fish & water ingestion	0.17 µg/L	
	Marine/estuarine fish/sheelfish ingestion	1.9 µg/L	
FL	Domestic/Drinking water	1.0 µg/L	Sittig 1994
HI	Salfwater fish consumption	3.5 µg/L	CELDs 1993
IN	4-d avg.; outside of mixing zone	107µg/L	
KS	Drinking water guideline	1.7 µg/L	FSTRAC 1990
KY	Consumption of fish tissue	10.7 µg/L	CELDs 1993
	Water supply sources	0.17 µg/L	
LA	Drinking water supply	0.16 µg/L	
	Non-drinking water supply	1.80 µg/L	
MA	Domestic/Drinking water	2 µg/L	Sittig 1994
MI	Domestic/Drinking water	0.18 µg/L	Sittig 1994
MN	Drinking water guideline	2 µg/L	FSTRAC 1990
MO	Fish consumption	11 µg/L	CELDs 1993
	Drinking water supply	0.17 µg/L	
NJ	Domestic/Drinking water	2.0 µg/L	Sittig 1994
NY	Domestic/Drinking water	0-2.5 µg/L	
OR	Water & fish ingestion	0.17 µg/L	CELDs 1993
	Fish consumption only	10.7 µg/L	
RI	Drinking water guideline	2.0 µg/L	FSTRAC 1990
SD	Domestic water	0.17 µg/L	CELDs 1993
	All other uses	10.7 µg/L	CELDs 1993
TX	Domestic/Drinking water	4.26 µg/L	Sittig 1994

7. REGULATIONS AND ADVISORIES

7-1. Regulations and Guidelines Applicable to 1,1,2,2 Tetrachloroethane (continued)

Agency	Description	Information	Reference
STATE (cont.)			
VT	Class A or B water	0.17[a]	CELDs 1993
	Class C water	10.7[a]	CELDs 1993
	Drinking water guideline	0.7 µg/L	FSTRAC 1990
WV	Public water supply	0.17 µg/L	CELDs 1993
WI	Public water supplies-warmwater sport fish communities	1.7 mg/L	
	Public water supplies-cold water communities	1.6 mg/L	
	Public water supplies-Great Lakes communities	1.6 mg/L	
	Non-public water supplies-warm water sport fish communities	64 mg/L	
	Non-public water supplies-cold water communities	22 mg/L	
	Non-public water fupplies-warm water forage and limited forage fish communities and limited aquatic life	350 mg/L	
	Water Quality: Aquatic Life		CELDs 1993
AZ	Acute-cold water fishery	4700 µg/L	
	Acute-warm water fishery	4700 µg/L	
	Effluent dominated water	4700 µg/L	
	Chronic-cold water fishery	3200 µg/L	
	Chronic- warm water fishery	3200 µg/L	
	Chronic-effluent dominated water	3200 µg/L	
HI	Acute- saltwater	3000 µg/L	
LA	Acute- freshwater	923 µg/L	
	Acute- marine water	902 µg/L	
	Chronic- freshwater	462 µg/L	
	Chronic- marine water	451[a]	
NJ	Freshwater	9320 µg/L	
OH	Exceptional, seasonal, and modified warm waters, outside mixing zone-max.	1000 µg/L	
	Exceptional, seasonal, and modified warm waters, outside mixing zone, 30-d avg.	360 µg/L	
	Exceptional, seasonal, and modified warm waters; human health, 30-d avg.	107 µg/L	
	Inside mixing zone - maximum	2000 µg/L	

7. REGULATIONS AND ADVISORIES

7-1. Regulations and Guidelines Applicable to 1,1,2,2 Tetrachloroethane (continued)

Agency	Description	Information	Reference
STATE (cont.)			
OH (cont.)	Cold water & limited resource warm water, outside mixing zone-max.	1000 µg/L	
	Cold water; outside mixing zone, 30-d avg.	360 µg/L	
OH	Cold water & limited resource warm water; outside mixing zone, human health, 30-d avg.	107 µg/L	
	Inside mixing zone, max.	2000 µg/L	
OR	Chronic-freshwater	2400 µg/L	
	Acute-marine	9020 µg/L	
WV	Warm water fishery stream	10.7 µg/L	
	Trout waters	10.7 µg/L	
	Small non-fishable streams	10.7 µg/L	
	Water Quality: Recreational Use		CELDs 1993
AZ	Full body contact	7 µg/L	
	Partial body contact	450 µg/L	
TN		110 µg/L	
	Groundwater Quality Standards		CELDs 1993
MO		0.17 µg/L	
	Groundwater Monitoring Parameters		CELDs 1993
CO		Yes	
IL		Yes	
LA		Yes	
MN		Yes	
WV		Yes	
WI		Yes	
NJ	NPDES Permits: Testing Requirements for Organic Toxic Pollutants	Yes	
SD	Surface water Discharge Permit Application Requirements: Testing Requirements for Organic Toxic Pollutant	Yes	
	Toxic Discharge		CELDs 1993
CA		1.2 mg/L (30-d avg.)	
WI		Yes	

7. REGULATIONS AND ADVISORIES

7-1. Regulations and Guidelines Applicable to 1,1,2,2 Tetrachloroethane (continued)

Agency	Description	Information	Reference
STATE (cont.)			
c. Other:			
	Hazardous Waste		CELDs 1993
IL		Yes	
LA		Yes	
MA		Yes (LDR)	
WV		Yes	
	Hazardous Waste Constituents		CELDs 1993
CO		Yes	
IL		Yes (App. H)	
LA		Yes	
MN		Yes	
ND		Yes (App. IV)	
WV		Yes (App. VIII)	
WI		Yes (App. IV)	

[a] Not classifiable as to its carcinogenicity to humans
[b] Animal carcinogen

ACGIH = American Conference of Governmental and Industrial Hygienists; CELDs = Computer-aided Environmental Legislative; Database; CEPP = Chemical Emergency Preparedness and Prevention; CPSC = Consumer Product Safety Commission; DOT = Department of Transportation; EPA = Environmental Protection Agency; EPCRA = Emergency Planning and Community Right-to-Know Act; FR = Federal Register; FSTRAC = Federal State Toxicology and Regulatory Alliance Committee; FTLDLE = Ft. Lauderdale; GC/MS = Gas Chromatography/Mass Spectrometry; IARC = International Agency for Research on Cancer; ID No = Identification Number; IRIS = Integrated Risk Information System; KC = Kansas City; LDR = Land Disposal Restrictions; mfd. = manufactured; LOAEL = Lowest Observed Adverse Effect Level; NA = Not available at the present time; NATICH = National Air Toxics Information Clearinghouse; NCI = National Cancer Institute; NIOSH = National Institute of Occupational Safety and Health; NOAEL = No Observed Adverse Effect Level; NPDES = National Pollutant Discharge Elimination System; NTP = National Toxicology Program; OAR = Office of Air and Radiation; OERR = Office of Emergency and Remedial Response; ORM = Other Regulated Materials; OSHA = Occupational Safety and Health Administration; OSW = Office of Solid Waste; OW = Office of Water; PEL = Permissible Exposure Level; Phil = Philadelphia; proc. = processed; RCRA = Resource Conservation and Recovery Act; SWEST = Southwest; TLV = Threshold Limit Value; TWA = Time Weighted Average; UN = United Nations; WHO = World Health Organization